What we claim is:

1. A method of measuring the amplitude distortion component in an optical transmission signal subject to noise and amplitude distortion components, the method comprising determining the amplitude distortion component by analysing the bit error ratio (BER) of the signal as a function of a movable decision threshold.

2. A method as claimed in Claim 1, wherein the analysis is performed in a high bit error ratio area and in a low bit error ratio area.

3. A method as claimed in Claim 1, wherein the analysis comprises the steps of:

determining BER values as a function of the position of said movable decision threshold in said high bit error ratio area and in said low bit error ratio area;

extrapolating the BER values in both the high bit error ratio area and the low bit error ratio area to obtain respective first and second decision threshold values corresponding to a predetermined value of BER in both the high bit error ratio area and the low bit error ratio area;

determining the difference V1 between said first and second decision threshold values in the low bit error ratio area;

determining the difference V2 between said first and second decision threshold values in the high bit error ratio area; and

determining the ratio V1/V2 as a measure of the amplitude distortion component of the signal.

4. A method as claimed in Claim 3, wherein said predetermined value of BER is 0.25.

5. A method as claimed in Claim 1, wherein said analysis is performed on values of BER after Q conversion in accordance with the function $Q = 2^{1/2}\mathrm{erfc}^{-1}(4\mathrm{xBER})$, in which *erfc* is the complementary error function.

6. A method as claimed in Claim 1, further comprising the step of providing said BER values by comparing the said signal with a said variable decision threshold.

7. A method as claimed in Claim 1, further comprising the steps of:

estimating a second bit error ratio by projecting BER values from said first and second decision threshold values in the high bit error ratio area and at the same gradient as said extrapolations in the lower bit error ratio area; and

determining the intersection of said projected BER values to obtain an estimated BER value, indicative of an optical signal-to-noise ratio of said optical signal.

8. A method as claimed in Claim 1, performed by a programmed computer.

9. An optical transmission system comprising measuring means to measure the amplitude distortion component in an optical transmission signal subject to noise and amplitude distortion components, the measuring means adapted to measure the amplitude distortion component by analysing the bit error ratio (BER) of the signal as a function of a movable decision threshold.

10. An optical transmission system as claimed in Claim 9, wherein said measuring means is adapted to perform said analysis in a high bit error ratio area and in a low bit error ratio area.

11. An optical transmission system as claimed in Claim 10, wherein said measuring means comprises:

BER determining means to determine BER values as a function of the position of said movable decision threshold in said high bit error ratio area and in said low bit error ratio area;

BER extrapolating means to extrapolate the BER values in both the high bit error ratio area and the low bit error ratio area to obtain respective first and second decision threshold values corresponding to a predetermined value of BER in both the high bit error ratio area and the low bit error ratio area;

first difference determining means to determine the difference V1 between said first and second decision threshold values in the low bit error ratio area;

second difference determining means to determine the difference V2 between said first and second decision threshold values in the high bit error ratio area; and

dividing means to determine the ratio V1/V2 as a measure of the amplitude distortion component of the signal.

12. An optical transmission system as claimed in Claim 11, wherein said predetermined value of BER is 0.25.

13. An optical transmission system as claimed in Claim 9, wherein said analysis is performed on values of BER after Q conversion in accordance with the function $Q = 2^{1/2}\mathrm{erfc}^{-1}(4\mathrm{xBER})$, in which *erfc* is the complementary error function.

14. An optical transmission system as claimed in Claim 9, further comprising comparing means to provide said BER values by comparing the said signal with a said variable decision threshold.

15. An optical transmission system, comprising optical receiver means to detect optical transmission signals and convert them into their electrical equivalent, clock extraction means to extract clock timing signals from the received optical signals, first and second digital-to-analogue converters providing first inputs to first and second analogue amplifiers, said optical receiver means providing second inputs to said first and second analogue amplifiers, first and second bi-stable circuit means connected respectively to outputs of said first and second analogue amplifiers and synchronised by said extracted clock signals, outputs of said bi-stable circuit means connected to inputs of an exclusive-OR gate, an output of said exclusive-OR gate providing error signals input to a counter, whereby said counter accumulates a count representing the bit error ratio in said received optical signals, and said digital-to-analogue converters being controlled by processor means to determine decision threshold separations V1 and V2 in the eye that represent amplitude distortion components in said received optical signals.

16. A computer program adapted to perform the method steps of Claim 1.

17. A carrier on which is stored a program adapted to perform the method steps of Claim 1.

18. An optical transmission system incorporating a processor programmed to perform the method claimed in Claim 1.

19. An optical transmission system incorporating a processor adapted to operate in response to a carrier as claimed in Claim 17.

20. An optical receiver comprising detector means to detect optical signals from an optical transmission system and convert them into their electrical equivalent, the receiver comprising measuring means to measure the amplitude distortion component in a said optical signal subject to noise and amplitude distortion components, the measuring means adapted to

measure the amplitude distortion component by analysis of the bit error ratio (BER) of the signal as a function of a movable decision threshold.

21. An optical receiver as claimed in Claim 20, wherein said measuring means is adapted to perform said analysis in a high bit error ratio area and in a low bit error ratio area.

22. An optical receiver as claimed in Claim 20, wherein said measuring means comprises:

BER determining means to determine BER values as a function of the position of said movable decision threshold in said high bit error ratio area and in said low bit error ratio area;

BER extrapolating means to extrapolate the BER values in both the high bit error ratio area and the low bit error ratio area to obtain respective first and second decision threshold values corresponding to a predetermined value of BER in both the high bit error ratio area and the low bit error ratio area;

first difference determining means to determine the difference V1 between said first and second decision threshold values in the low bit error ratio area;

second difference determining means to determine the difference V2 between said first and second decision threshold values in the high bit error ratio area; and

dividing means to determine the ratio V1/V2 as a measure of the amplitude distortion component of the signal.

23. An optical receiver as claimed in Claim 22, wherein said predetermined value of BER is 0.25.

24. An optical receiver as claimed in Claim 20, wherein said analysis is performed on values of BER after Q conversion in accordance with the function:

$Q = 2^{1/2}\text{erfc}^{-1}$ (4xBER), in which *erfc* is the complementary error function.

25. An optical receiver as claimed in Claim 20, further comprising comparing means to provide said BER values by comparing the said signal with a said variable decision threshold.

26. An optical receiver comprising detector means to detect optical signals from an optical transmission system and convert them into their electrical equivalent, clock extraction means to extract clock timing signals from the received optical signals, first and second digital-to-analogue converters providing first inputs to first and second analogue amplifiers,

said optical receiver means providing second inputs to said first and second analogue amplifiers, first and second bi-stable circuit means connected respectively to outputs of said first and second analogue amplifiers and synchronised by said extracted clock signals, outputs of said bi-stable circuit means connected to inputs of an exclusive-OR gate, an output of said exclusive-OR gate providing error signals input to a counter, whereby said counter accumulates a count representing the bit error ratio in said received optical signals, and said digital-to-analogue converters being controlled by processor means to determine decision threshold separations V1 and V2 in the eye that represent amplitude distortion components in said received optical signals.

27. An optical signal received by an optical receiver as claimed in Claim 20.

28. A computer programmed to perform the method of Claim 1.